

Unit 11

Day 2

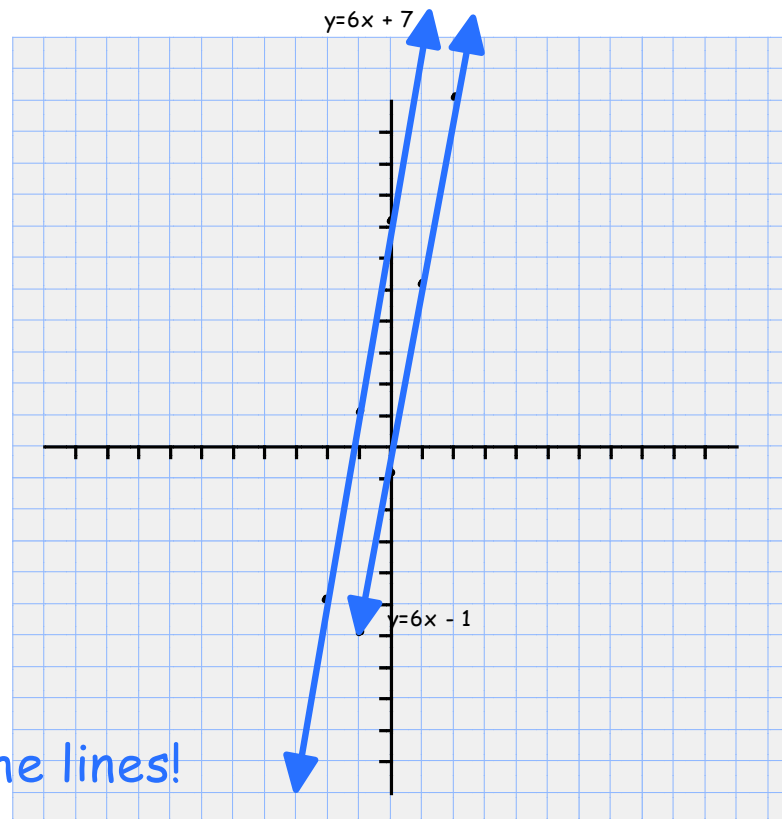
Parallel and Perpendicular Lines

Parallel lines are a set of lines that do not intersect.
Parallel lines have slopes that are equal and y-intercepts that are different.

Examples of Parallel Lines

$$y = 6x + 7$$

$$y = 6x - 1$$

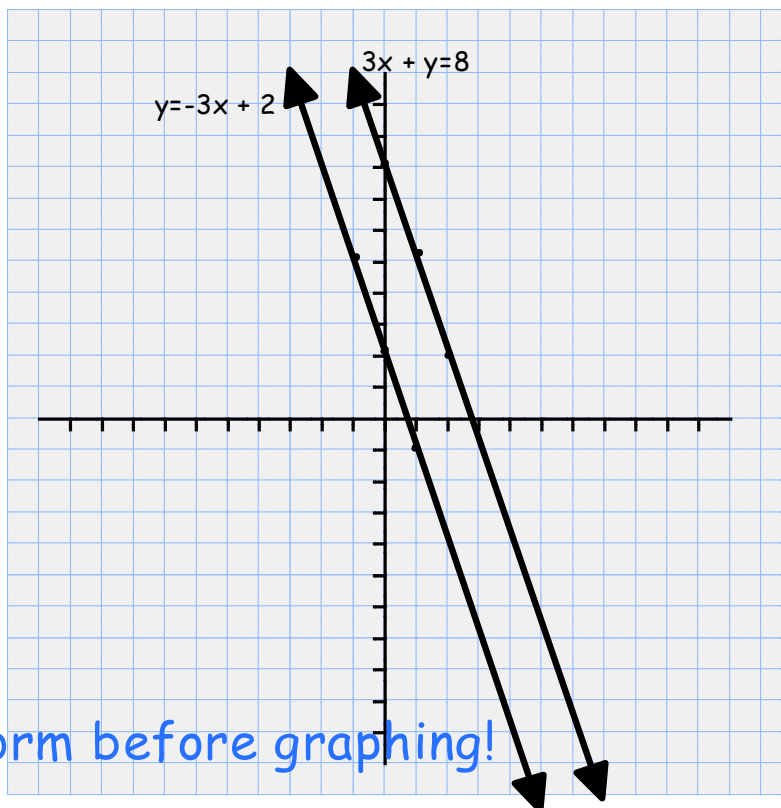


Note the inaccuracy of the lines!

Examples of Parallel Lines

$$3x + y = 8$$

$$y = -3x + 2$$



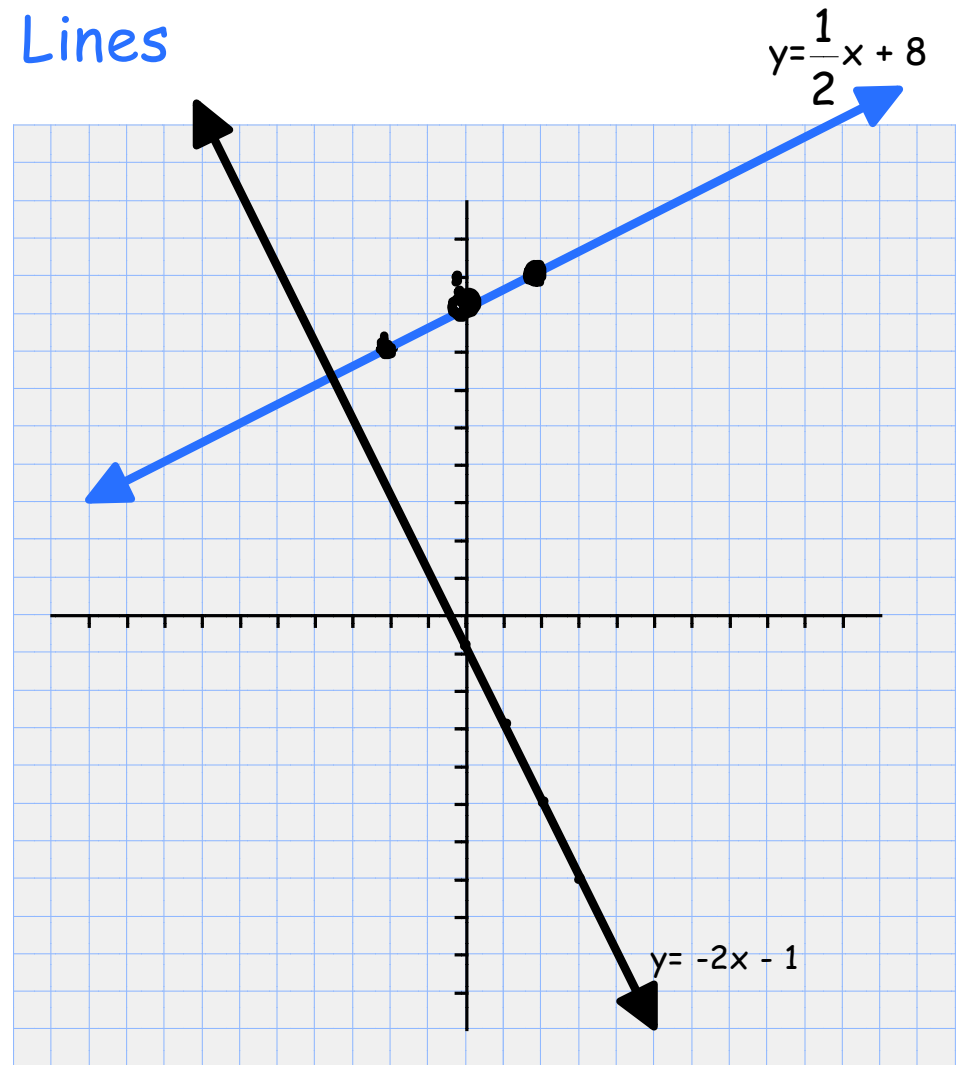
Remember to put line in SI form before graphing!

Perpendicular lines are two lines that intersect to form right angles (90°). Perpendicular lines will have slopes that are opposite reciprocals.

Examples of Perpendicular Lines

$$y = \frac{1}{2}x + 8$$
$$y = -2x - 1$$

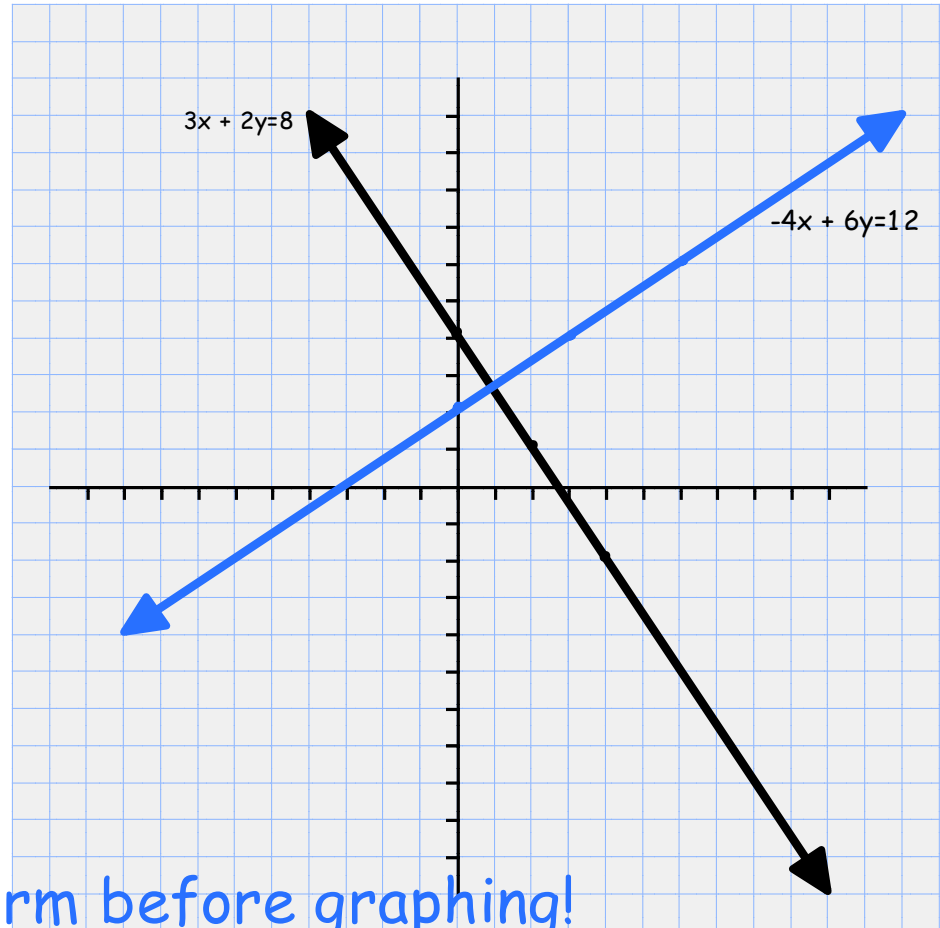
$$y = \frac{1}{2}x + 8$$
$$b = 8$$
$$m = \frac{1}{2}$$



Examples of Perpendicular Lines

$$3x + 2y = 8$$

$$-4x + 6y = 12$$




Remember to put line in SI form before graphing!

Determine if the lines through the given set of points are parallel, perpendicular, or neither to each other.

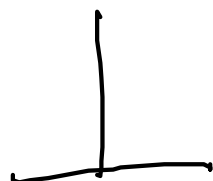
1) $(3,7)$ $(2,3)$ and $(2,-2)$ $(6,-3)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3-7}{2-3} = \frac{-4}{-1} = 4 \quad m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{-2+3}{2-6} = \frac{1}{-4}$$



2) $(5,-4)$ $(5,7)$ and $y=3$

$$m = \frac{7+4}{5-5} = \text{Undefined}$$



3) Find the value of w so the line that goes through $(w, 3)$ and $(-1, -6)$ is parallel to $6x - 2y = 7$.

$$y - y_1 = m(x - x_1)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$3 = \frac{3 + 6}{w + 1}$$

$$3w + 3 = 9$$

$$3w = 6$$

$$w = 2$$

$$(2, 3)$$

$$-2y = -6x + 7$$

$$y = 3x - \frac{7}{2}$$

$$m = 3$$

$$\parallel m = 3$$

$$\perp m = -\frac{1}{3}$$

- 4) Same as example 3, except find the value of w so that the lines will be perpendicular.

$$-\frac{1}{3} = \frac{3 + 6}{w + 1}$$

$$-w - 1 = 27$$

$$-w = 28$$

$$w = -28$$

Homework: Parallel/Perpendicular Wksht 1-6